

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KOJI SATO, RIKIZO WATANABE,
TAKEHIRO OHNO, YOSHIKI MASUGATA,
MINORU TAKUMA, SHIGEAKI SATO and
YOSHIMI SENDA

Appeal No. 1997-0377
Application 08/151,808

HEARD: SEPTEMBER 14, 2000

Before JOHN D. SMITH, PAK, and LIEBERMAN, Administrative Patent Judges.

JOHN D. SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal pursuant to 35 U.S.C. § 134 from the final rejection of claims 20 through 31, all of the claims in this application.

Claim 20 is representative and is reproduced below:

20. An alloy wire of high strength and low thermal expansion, wherein:

the wire is made of an alloy which has a chemical composition of, by weight, 0.06% to 0.5% C, 65% or less Co, and less than 30% Ni in total amount of 25% to 65% of Co + Ni, and the balance being Fe as a main component, other optional elements and unavoidable

impurities, and which has a primary phase of austenite phase and martensite phase induced by working, and wherein the wire has 150 kgf/mm² or more of tensile strength at normal temperature and an average thermal expansion coefficient of $6 \times 10^{-6}/^{\circ}\text{C}$ or less at from normal temperature to 230 $^{\circ}\text{C}$.

The references of record relied upon by the examiner are:

Decker et al. (Decker)	3,093,519	June 11, 1963
Yamada et al. (Yamada)	4,203,782	May 20, 1980
Enomoto (Japanese Patent Application)	4-354848	Dec. 9, 1992

The appealed claims stand rejected under 35 U.S.C. § 103 as unpatentable over either Decker or Enomoto combined with Yamada.

We do not sustain the examiner's stated rejections.

The subject matter on appeal is directed to an alloy wire of high-strength and low-thermal expansion. According to the claimed invention, the wire has 150 kgf/mm² or more of tensile strength at normal temperature and an average thermal expansion coefficient of $6 \times 10^{-6}/^{\circ}\text{C}$ or less at from normal temperature to 230 $^{\circ}\text{C}$. Appellants' claimed alloy wire is characterized as having desirable combination of properties which provides a significant technical advance in wire products. As evident from appealed claim 20 reproduced above, the claimed alloy wire is made of an alloy of specific chemical composition and micro structure.

In their brief at pages 5 and 6, appellants acknowledge that conventionally, steel wires have been used for a core wire in power transmission lines which require high tensile strength and torsional strength. Appellants admit that conventional steel wires

provide the requisite tensile strength and torsional property, but fail to provide a satisfactory thermal expansion coefficient. Thus, according to appellants, a typical value for conventional steel core wires is around $10 \times 10^{-6}/EC$ to $12 \times 10^{-6}/EC$. The conventional iron/nickel-type alloy wires are said to have a low thermal expansion coefficient and acceptable torsional strength. However, the tensile strength of such wires is inadequate generally being in the range of 100-130 kgf/mm², values which are considerably lower than the presently claimed alloy wire which has a tensile strength of at least 150 kgf/mm². Appellants further explain that a low thermal expansion is required because increased power transmission results in high temperatures causing the wire to thermally expand and sag. Appellants' claimed alloy wire is said to be unique in the sense that it provides both the high strength and low thermal expansion properties required for this utility.

As evidence of obviousness of the herein claimed subject matter, the examiner relies on the combined teachings of Decker and Yamamoto and alternatively the combined teachings of Enomoto and Yamamoto. Respecting the claimed requirements of high strength and low thermal expansion specifically set forth in appellants' appealed claims, the examiner indicates that neither of his "primary references" disclose the combination of both properties. However, the examiner argues that since the claimed alloy compositions and microstructures "are overlapped by the cited references," the recited tensile strength property of greater than 150 kgf/mm² and the recited low thermal expansion coefficient of $10 \times 10^{-6}/EC$ or less "would have

been inherently possessed” by the alloys described in either of Decker or Enomoto. See the answer at page 5.

Respecting the examiner's finding of inherency, appellants point out that to the extent the prior art references disclose the claimed properties, Decker discloses an alloy having a thermal expansion of $10.08 \times 10^{-6}/^{\circ}\text{C}$ which is a value substantially higher than the thermal expansion coefficient of appellants' claimed alloy. Similarly, with respect to the examiner's alternatively relied upon “primary reference” to Enomoto, appellants point out that the alloys disclosed in this reference possess a tensile strength of no more than 100 kgf/mm², values which are significantly lower than the tensile strength recited in the instant claims. See the brief at page 11. Thus, the objective evidence in the record before us does not support the examiner's contention that the herein claimed properties would have been inherently possessed by the prior art alloys.

Respecting the examiner's “overlapping” alloy composition arguments, the examiner has simply not come to grips with the specific teachings in the relied upon prior art references that, when logically combined, would lead one away from, inter alia, the use of carbon in an alloy in the herein claimed range. Compare the brief at pages 9 and 14.

For the above reasons as well as the additional reasons set forth in appellants' briefs, we agree with appellants that the examiner has failed to meet his burden of establishing a prima facie case of obviousness for the subject matter defined by the appealed claims.

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The decision of the examiner is reversed.

REVERSED

JOHN D. SMITH)	
Administrative Patent Judge))	
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)	
CHUNG K. PAK)	BOARD OF PATENT
Administrative Patent Judge))	APPEALS AND
))	INTERFERENCES
)	
PAUL LIEBERMAN)	
Administrative Patent Judge))	

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